

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated December 4, 2003. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Applicants respectfully thank the Examiner for her consideration in having a personal interview with the Applicants' representative and their undersigned attorney on February 17, 2004. During the interview, Applicants' attorney discussed the differences between the prior art of record and the present invention as recited in the claims, but no agreement was reached. It is understood that further consideration by the Examiner of the prior art would have to be given upon the filing of an official response, including additional references of which the Examiner is aware but has not made of record.

This response is being filed in conjunction with a Request for Continuing Examination.

Status of the Claims

Claims 1-11 are under consideration in this application. Claims 1-2 and 8-9 are being amended, as set forth in the above marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. New claims 10 and 11 are being submitted for consideration.

Additional Amendments

The claims are being amended to correct formal errors and/or to better recite or describe the features of the present invention as claimed. All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

Claims 1-3, 5-6 and 8-9 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pat. No. 6,383,668 to Fullerton et al. (Fullerton '668). Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton '668 in view of U.S. Pat. App. No. 2002/0098389 to Wang et al. (Wang '389), and claim 7 was rejected as being unpatentable over Fullerton in view of U.S. Pat. App. No. 2002/0160234 to Sakawaki et al. (Sakawaki '234).

The present invention as recited in claim 1 is directed to a magnetic recording medium comprising: a substrate; an underlayer formed over the substrate; a magnetic recording layer formed directly on the underlayer, having a first magnetic layer, a second magnetic layer and, a non-magnetic intermediate layer formed between the first magnetic layer and the second magnetic layer, wherein the first magnetic layer consisting of Co, Pt, and Cr and formed directly on the underlayer. The non-magnetic intermediate layer contains at least one element selected from the group consisting of Ru, Ir, and Rh. The second magnetic layer contains Co as a main component. The first magnetic layer and the second magnetic layer are magnetized in the antiparallel direction in the absence of an applied magnetic field, and the amount of Pt contained in the first magnetic layer is no less than 3 at% and no more than 9 at%.

According to claim 2, the present invention is directed to a magnetic recording medium including a substrate and a magnetic recording layer formed thereon with an underlayer interposed between them. The magnetic recording layer comprises: a first magnetic layer containing Pt formed directly on the underlayer, a second magnetic layer, and a non-magnetic intermediate layer formed between the first magnetic layer and the second magnetic layer. The first magnetic layer and the second magnetic layer are magnetized in the antiparallel direction in the absence of an applied magnetic field, the amount of Pt contained in the first magnetic layer is no less than 3 at % and no more than 9 at %, wherein the magnetic recording layer is formed directly on the underlayer.

According to claim 8, the present invention is directed to a magnetic storage which comprises a magnetic recording medium, a drive unit to turn the magnetic recording medium, a magnetic head consisting of a writing part and a reading part, a means to move the magnetic head relative to the magnetic recording medium, and a signal processing unit to send and receive signals to and from the magnetic head, wherein the reading part of the magnetic head is a giant magneto-resistive effect element or has a tunnel junction which produces the magneto-resistive effect. The magnetic recording medium is comprised of: a substrate; an underlayer formed over the substrate; and a magnetic recording layer formed directly on the underlayer, having a first magnetic layer, a second magnetic layer and, a non-magnetic intermediate layer formed between the first magnetic layer and the second magnetic layer, wherein the first magnetic layer consisting of Co, Pt, and Cr and being formed directly on the underlayer. The non-magnetic intermediate layer contains at least one element selected from the group consisting of Ru, Ir, and Rh. The second magnetic layer contains Co as a main component. The first magnetic layer and the second magnetic layer are magnetized in the antiparallel direction in the absence of an applied magnetic field, and the amount of Pt contained in the first magnetic layer is no less than 3 at % and no more than 9 at %.

Finally, according to claim 9, the present invention is directed to a magnetic storage

which comprises a magnetic recording medium, a drive unit to turn the magnetic recording medium, a magnetic head consisting of a writing part and a reading part, a means to move the magnetic head relative to the magnetic recording medium, and a signal processing unit to send and receive signals to and from the magnetic head, wherein the reading part of the magnetic head is a giant magneto-resistive effect element or has a tunnel junction which produces the magneto-resistive effect. The magnetic recording medium is comprised of a substrate and a magnetic recording layer formed thereon with an underlayer interposed between them, wherein the magnetic recording layer incorporates a first magnetic layer containing Pt formed directly on the underlayer, a second magnetic layer, and a non-magnetic intermediate layer formed between the first magnetic layer and the second magnetic layer. The first magnetic layer and the second magnetic layer are magnetized in the antiparallel direction in the absence of an applied magnetic field, the amount of Pt contained in the first magnetic layer is no less than 3 at % and no more than 9 at %, wherein the magnetic recording layer is formed directly on the underlayer.

Applicants respectfully contend that neither Fullerton nor any other cited reference teaches or suggests forming the magnetic recording layer directly on the underlayer.

In contrast, Fullerton's magnetic recording media comprises a substrate 21, an underlayer 23, a host layer 30, and a magnetic recording layer 25 (Fig. 2; col. 4, lines 2-5). The **host layer** 30 underneath the magnetic recording layer 25 (rather than the **magnetic recording layer** as in the present invention) is made up of two ferromagnetic film 32, 34 separated by a nonferromagnetic spacer film 36, but whose thicknesses and materials are selected so that the moments from the individual ferromagnetic films essentially cancel. That is, the host layer has no net magnetic moment, or a very small nonzero moment, so that it does not contribute to the remanent magnetization of the magnetic recording layer 25 (See col. 2, lines 18 - 24).

Contrary to the Examiner's assertion in the Office Action, this teaching directly contradicts the use of a three-layer structure as a magnetic recording layer as in the present invention. In other words, the teachings of Fullerton '668 shows that the structure of the host layer cannot be used as recording layer as the desired zero magnetic moment in the host layer would prevent one from reading data from that structure. In effect, this reference teaches away from the present invention. It is well established that the use of a reference that teaches away from the present invention is an improper rejection.

Further, Since Fullerton '668 cannot now be cited as a primary reference against the present invention, none of the other references which are only cited as secondary references to show very specific features, those same references cannot be used to sustain any rejection such that any of the features of the present invention as now claimed can be rendered obvious by those references, either individually or in combination. The present invention as a whole is

distinguishable and thereby allowable. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

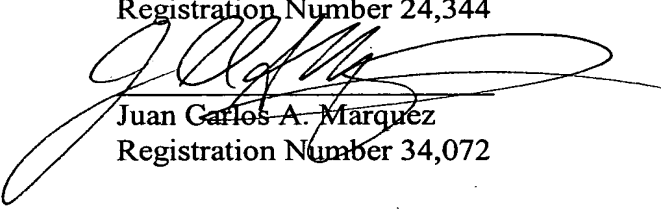
Conclusion

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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